

Dual Polarization Multi-Frequency Antenna Array, Phase I

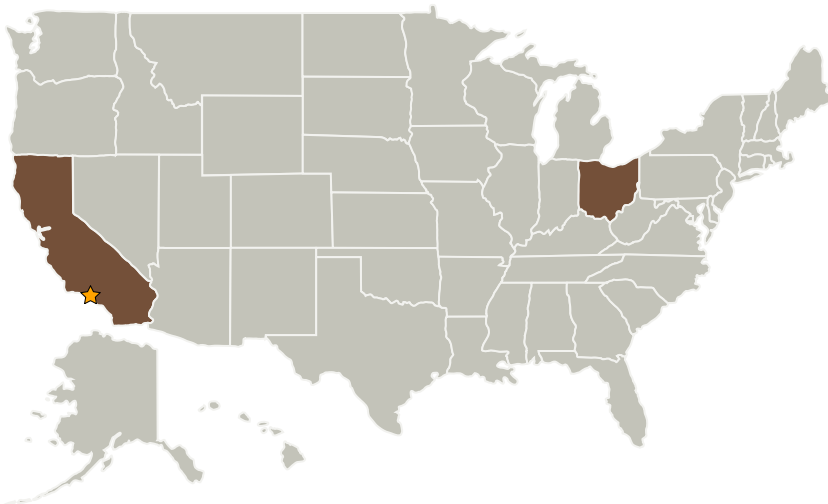
Completed Technology Project (2008 - 2008)



Project Introduction

Innovative approaches for broadband multi-function antennas that conserve vehicle weight and reduce drag are welcome solutions for all airborne platforms including suborbital vehicles, where less total weight translates to longer mission times, less expensive payloads, and more acrobatic flight control. The Spectra Research team proposes an innovative approach to accomplishing the program objectives by employing advances in fragmented aperture antenna designs, and Meta-Materials research, in concert with the extensive Spectra Research capability in designing broadband antennas, to develop a low weight, low profile antenna system capable of operation over the electromagnetic region from 10 to 40 GHz. Designs will be addressed for antenna elements that can accommodate either broadband or multiband operation with polarization diversity. The primary technical objectives of the proposed program are to apply the advances in fragmented aperture arrays toward the goal of achieving an innovative broadband reconfigurable array. Extensive research conducted by Spectra Research in the area of fragmented aperture topologies have shown that this technology is ideally suited for applications requiring extremely broad bandwidths (in a reduced footprint) coupled with the capability for rapid reconfigurability of the antenna aperture. Such reconfiguration can accommodate efficient beam scanning, beam forming, and rapid polarization diversity (switching between various polarization modes). A key area of investigation will be into the application of fragmented aperture arrays, meta-materials, and continuously-variable distributed-circuit phase shifters using thin-film ferroelectric technologies.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Spectra Research, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Dayton, Ohio

Primary U.S. Work Locations

California	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Daniel Reuster

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.6 Innovative Antennas